Installation and Operating Instructions

TOUCH800

Version: V3.20140804

30322538-02-EN

Read and follow these operating instructions.

Keep these operating instructions in a safe place for later reference.

Company details

Document

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1 For your safety

1.1 Basic safety instructions

Please read the following safety instructions carefully before using the product for the first time.

- Do not operate the terminal while driving in road traffic. Come to a standstill in order to use the unit.
- Before maintaining or repairing the tractor, always disconnect the connection between the tractor and the terminal.
- Before charging the tractor battery, always disconnect the connection between the tractor and the terminal.
- Before welding on the tractor or implement, always disconnect the power supply to the terminal.
- Do not make any unauthorized modifications to the product. Unauthorized modifications or use may impair safety and reduce the service life or operability of the unit. Modifications are considered unauthorized if they are not described in the product documentation.
- Follow all recognized safety, industrial and medical rules as well as all road traffic laws.
- The product does not include any user serviceable parts. Do not open the casing.
- Read the operating instructions to the agricultural device which you want to control by using the product.

1.2 Intended use

The terminal is used to operate agricultural machinery equipped with ISOBUS job computers.

Intended use also includes compliance with the conditions for operation and repairs prescribed by the manufacturer.

The manufacturer cannot be held liable for any personal injury or property damage resulting from such non-compliance. All risk arising from improper use lies with the user.

All applicable accident prevention regulations and all other generally recognized safety, industrial, and medical standards as well as all road traffic laws must be observed. Any unauthorized modifications made to the equipment will void the manufacturer's warranty.

1.3 Layout and meaning of warnings

All safety instructions found in these Operating Instructions are composed in accordance with the following pattern:

⚠ WARNING

This signal word identifies medium-risk hazards, which could potentially cause death or serious physical injury, if not avoided.

⚠ CAUTION

This signal word identifies low-risk hazards, which could potentially cause minor or moderate physical injury or damage to property, if not avoided.

NOTICE
This signal word identifies actions which could lead to operational malfunctions if performed incorrectly. These actions require that you operate in a precise and cautious manner in order to produce optimum work results.

There are some actions that need to be performed in several steps. If there is a risk involved in carrying out any of these steps, a safety warning will appear in the instructions themselves.

Safety instructions always directly precede the step involving risk and can be identified by their bold font type and a signal word.

Example

1. NOTICE! This is a notice. It warns that there is a risk involved in the next step.
2. Step involving risk.

1.4 Disposal

When it has reached the end of its service life, please dispose of this product as electronic scrap in accordance with all applicable waste management laws.

1.5 Instructions on retrofitting

Instructions on how to retrofit electrical and electronic farm equipment and/or components

Agricultural equipment used today features electronic components and parts whose function can be affected by other farm equipment which emits electromagnetic waves. Such effects could lead to personnel being put in danger, if the following safety instructions are not adhered to.

Selecting components

When selecting components, make sure first of all that the retrofitted electrical and electronic components comply with the current version of the EMC Directive 2004/108/EC and carry the CE marking.

User responsibility

When retrofitting a machine with electrical and electronic farm equipment and/or components connected to the vehicle's electrical system, it is your own responsibility to check whether the installation causes interference with the vehicle's electronic system or other components. This applies, in particular, to the electronic control of:

- electronic hitch control (EHR),
- front linkage,
- power take off (PTO),
- engine,
- gear.

Additional requirements

The following requirements must be met in order to retrofit mobile communication systems (e.g. radio, phone):

- All farm equipment must be approved and installed in accordance with the regulations applicable in the respective country.
- The equipment must be installed as a fixed installation.
- The operation of portable or mobile farm equipment in the interior of the vehicle is only permitted via a connection to a permanently installed exterior antenna.

- The transmitting part must be spatially separated from the vehicle's electronic system.
- When attaching the antenna, pay attention to proper installation, including a sound ground connection between the antenna and the vehicle's ground wire.

For information on wiring and installation as well as the maximum allowable current consumption, please also refer to the installation guide provided by the machine manufacturer.

2 About these Operating Instructions

2.1 Target group of these Operating Instructions

These Operating Instructions are intended for personnel entrusted with installing and operating the terminal.

2.2 Layout of operating instructions

The operating instructions explain step by step how you can perform certain operations with the product.

We use the following symbols throughout these Operating Instructions to identify different operating instructions:

Type of depiction	Meaning
1. 2.	Actions that must be performed in succession.
⇨	Result of the action. This will happen when you perform an action.
⇨	Result of an operating instruction. This will happen when you have completed all steps.
☑	Requirements. In the event that any requirements have been specified, these must be met before an action can be performed.

2.3 Layout of references

If any references are given in these Operating Instructions, they will appear as:

Example of a reference: [➞ 9]

References can be identified by their square brackets and an arrow. The number following the arrow shows you on what page the chapter starts where you can find further information.

2.4 Directional information in these instructions

All directional information in these instructions, such as "left", "right", "forward", "back", is relative to the movement direction of the vehicle.

2.5 Current version

The current version of these instructions can be found on our website: www.mueller-elektronik.de.

3 Product description

3.1 Scope of delivery

The following items are included in delivery:

- TOUCH800 terminal
- VESA holder and screws
- Bracket for mounting the terminal
- USB memory device
- Installation and Operating Instructions

3.2 Terminal buttons

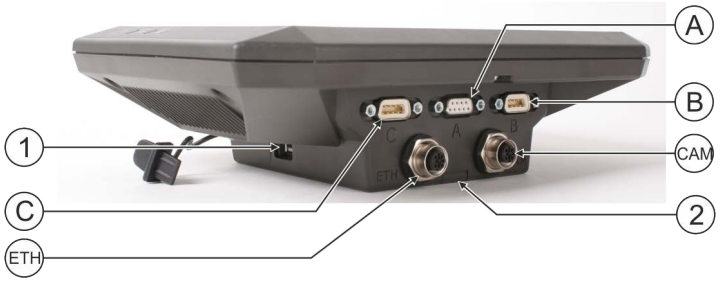
You will find a number of buttons on the housing of the terminal that are used to operate the terminal.

1	Terminal buttons

Function of the buttons

	Switches the terminal on and off.
	Creates screenshots.
	Saves the window layout.

3.3 Terminal ports



Terminal ports

(1)	USB port for: - USB memory device [➙ 28]	(A)	Port A CAN bus port for: - ISOBUS basic equipment [➙ 16] - Connection to the tractor CAN bus
(C)	Port C RS232 serial port for: - GPS receiver [➙ 17] - "GPS TILT-Module" terrain compensation - ME-LightBar [➙ 20]	(B)	Port B See section: Pin assignment Port B [➙ 59]
(ETH)	ETH port M12 port for: - Ethernet	(CAM)	CAM port Port for an analog camera [➙ 43]
		(2)	Slot with the SD card

3.4 Applications on the terminal

The terminal is delivered with a range of installed application (apps). Most of these can be used immediately. Some applications you can only test for a limited period of time. If you like some specific application, you can order a license from Müller-Elektronik and unlock the full version of the application.

Full versions

The full versions of the following applications are installed on the terminal:

- ISOBUS interface (ISOBUS-UT)
  The terminal enables you to operate ISOBUS job computers which are ISO 11783 compliant. The user interfaces for operating a job computer are shown on the terminal screen if this is connected to the ISOBUS connector of the vehicle.
  The ISOBUS interface has no icon of its own. The icon for the connected job computer will always be displayed in the selection menu.
- - Service application.
  The Service application allows you to:
  - Configure the terminal.
  - Enable and disable other applications.
  - Enter license activation codes.
  - Enable drivers for connected devices.
  - Configure the GPS settings.
- - ISOBUS-TC application.
  The ISOBUS-TC application (task controller) provides an interface between a Farm Management Information System (FMIS), the terminal and the ISOBUS job computer. ISOBUS-TC allows you to use the terminal to process ISO-XML files with planned task data from your PC based FMIS. If you do not have an FMIS, you can setup and process tasks on the terminal.
  The ISOBUS-TC application complies with Part 10 of Standard ISO11783.
- - Tractor-ECU application.
  The Tractor-ECU application is used to record all settings around the tractor.
  This allows you to:

  - Input the position of the GPS receiver.
  - Set the GPS receiver as the speed signal source.

- - File Server application
  This application is used to define a save location on the terminal. This save location can be used by all ISOBUS implements which do not have their own USB interface.
- - Serial Interface application
  This application enables a data exchange between the terminal and an on-board computer via the serial interface. In this way, you can also use the GPS signal for machines which are not ISOBUS-compatible. You can transfer target rates to the on-board computer or switch sections. The data is sent using the LH5000 or ASD protocols.
  If you want to use the ASD protocol, you must activate the "ASD-Protocol" license.
- - Camera.
  The Camera application displays on the screen the image from the camera which is connected to the terminal.

Test versions

You can use the test versions of the following applications:

- - TRACK-Leader application with SECTION-Control and further modules.
  The TRACK-Leader application enables you to process exact parallel swaths in the field.
  Additional modules in the application handle the following tasks:
  - Automatic section control in order to minimize overlaps.
  - Automatic vehicle steering in the field.
  - Transfer target rates from a prescription map to the ISOBUS job computer.

Optional software

Optionally you can activate the following software:

- - FIELD-Nav application.
  FIELD-Nav is a navigation system for agricultural applications. This enables you to find your way to any field.
  You will find the operating instructions on the Müller-Elektronik website.

3.5 Information on the nameplate

You will find a nameplate sticker on the back of the terminal. On this sticker, you can find all the information you need to definitively identify the product.

Have these details ready when you contact Customer Services.

Abbreviations on the rating plate

Abbreviation	Meaning
SW:	Software version You can see the installed software version on the Start Screen of the Service application:
HW:	Hardware version

Abbreviation	Meaning
DC:	Operating voltage The terminal may only be connected to voltages within this range.
K.-Nr.:	Customer number If the terminal was manufactured for an agricultural machinery manufacturer, the agricultural machinery manufacturer's item number will be shown here.
SN:	Serial number

4 Mounting and installation

4.1 Mounting the terminal in the vehicle cab

You need a bracket to mount the terminal in the vehicle cab. The following brackets are available.

Item number	Type	Scope of delivery?	Properties
31322506	Standard bracket	Yes	
31322507	Optional bracket	No	▪ For a more sturdy attachment of the terminal.
31322508	Optional adaptor	No	▪ Is mounted on bracket 31322507. ▪ Suitable for vehicles without a B column. ▪ Is mounted around a pipe.

4.1.1 Mounting the standard bracket

Procedure

☑ You have the VESA bracket assembly kit within reach.

1. Screw the bracket together.
2. Secure the bracket with the four screws on the back side of the terminal.
3. Secure the terminal in the vehicle cab. You can, for example, use the ME mounting bracket for this purpose. It is included in the scope of delivery of the ISOBUS basic equipment.

⇨ Your terminal should be mounted as follows:

4. Check that your terminal is firmly mounted.

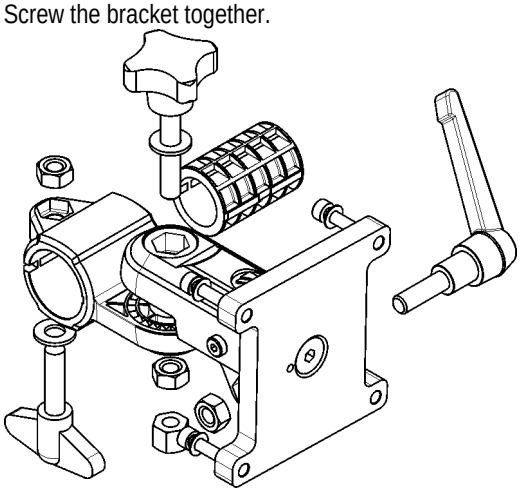
⇨ You can now connect cables to the terminal. [→ 10]

4.1.2 Mounting the optional bracket

Procedure

☑ You have the bracket assembly kit within reach.

1. Screw the bracket together.



2. Secure the bracket with the four screws on the back side of the terminal.
3. Put the bracket into the desired position, e.g.:

4. Secure the terminal in the vehicle cab. You can, for example, use the ME mounting bracket for this purpose. It is included in the scope of delivery of the ISOBUS basic equipment.

5. Check that your terminal is firmly mounted.

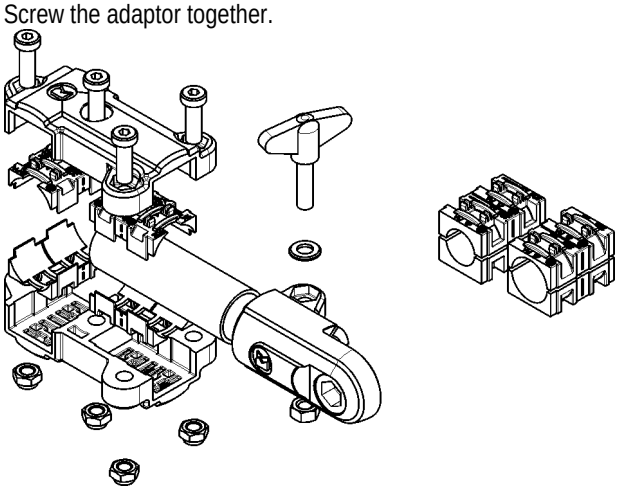
4.1.3 Mounting the optional adaptor

If you want to mount your terminal in a vehicle that does not have a B column, you can install an adaptor onto bracket 31322507. This adaptor can be mounted around a pipe.

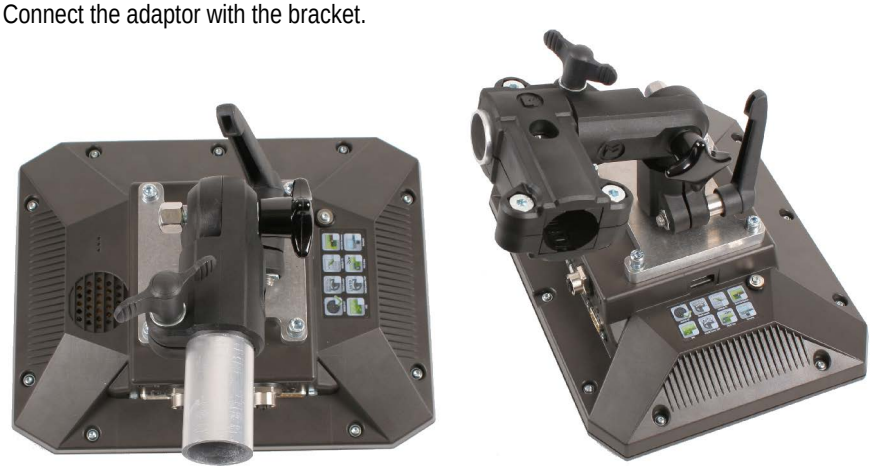
- Adaptor for round pipe systems, for pipes with a diameter of 20, 25 or 30 mm, item number: 31322508

Procedure

1. Screw the adaptor together.



2. Connect the adaptor with the bracket.



3. Put the bracket and the adaptor in the desired position.
4. Check that everything is firmly mounted.

4.2 Connecting the terminal to the ISOBUS

You will need a different connection cable for this, depending on the model of your tractor.

- In tractors which have been subsequently upgraded with an ISOBUS-basic vehicle harness from Müller-Elektronik, use connector cable A from the ISOBUS-basic vehicle harness.
- In tractors which are equipped as standard with ISOBUS and which have an ISOBUS In Cab Connector, you will need the following connector cable:
  - D-Sub <-> CPC connector cable, item no. 30322541

- In tractors which are fitted with their own ISOBUS terminal, but in which there is however no ISOBUS In Cab Connector, you can ask for the ISOBUS In Cab Connector to be retrofitted.
  - You can order the appropriate cable from Müller-Elektronik. Our sales team will be glad to advise you.

– For certain tractors, you can retrofit the connector cable without the ISOBUS In Cab Connector.
– In certain versions, you will also require the D-Sub <-> CPC connector cable, item no. 30322541

When there is more than one terminal in the tractor cab, you may need to change certain settings in order to enable two-way communication. Find out more: Using two terminals [→ 30]

Procedure

1. Connect the 9-pin plug A of the basic vehicle harness to the CAN port of the terminal.
2. Tighten the safety screws on the connector.

4.3 Connecting the GPS receiver to the terminal

Find out how to connect Müller-Elektronik GPS receiver to the terminal via the GPS receiver's Operating Instructions.

When mounting the terminal in a vehicle which is already fitted with a GPS receiver and another ISOBUS terminal, you must:
- connect the GPS signal to the terminal from Müller-Elektronik;
- configure the GPS receiver.

Procedure

To connect the terminal to a GPS receiver which is already installed on the vehicle:

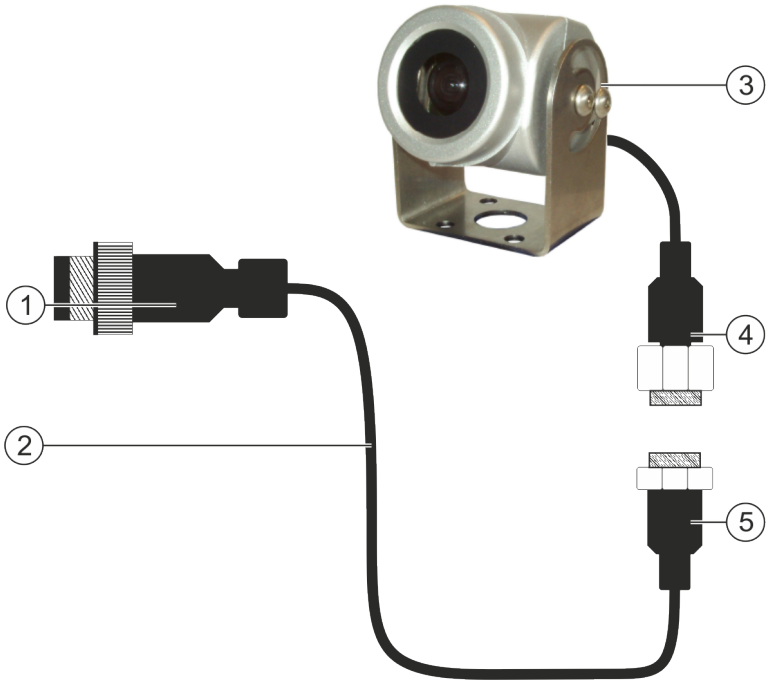
1. Find out how you can direct the signal from the GPS receiver to the terminal. This can differ for every vehicle or GPS receiver: Vehicles can be fitted with a GPS socket in the cab, a GPS receiver with a serial output or serial outputs to the ISOBUS terminal.
2. Check what cable you will use to connect GPS signal to the serial socket on the terminal from Müller-Elektronik.
3. Connect the GPS signal to the serial socket of the terminal from Müller-Elektronik.
4. Configure the GPS receiver so that it can communicate with the terminal from Müller-Elektronik. You can find the necessary specifications for this in the table below.
5. Activate the "Standard" GPS driver on the terminal.

Configuration

Frequencies	5 Hz (GPGGA, GPVTG)
	1 Hz (GPGSA, GPZDA)
Transmission rate	19200 baud
Data bits	8
Parity	no
Stop bits	1
Flow control	None

4.4 Connecting the camera to the terminal

4.4.1 Connecting the camera HQ



Camera HQ - Connection to the Touch Terminal

1	Plug for connection to the terminal. CAM port	3	Camera HQ
2	Extension cable	4	Camera plug
		5	Connector for the camera plug

Procedure

1. Screw the camera together with its bracket, as described in the assembly instructions of the camera manufacturer.
2. Connect the camera to the extension cable.
3. CAUTION! When laying out the extension cable, ensure that there are no kinks and that no one can stumble over the laid-out cable.
4. Connect the extension cable to the CAM port of the terminal.
5. Secure the camera.
6. Activate the camera. [➞ 43]

4.4.2 Connecting the camera NQ

Camera with adapter cable

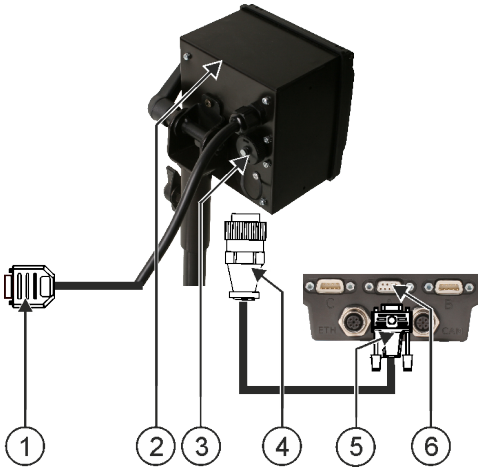
1	Plug for connection to the terminal. CAM port	4	Camera
2	Connector for the adapter cable	5	Camera plug
3	Connector for the extension cable	6	Connector for the camera plug

Procedure

1. Connect the cables to each other as shown in the figure. Pay attention to cable lengths when doing so.
2. CAUTION! When laying out the cable, ensure that there are no kinks in the cable and that no one can stumble over the laid-out cable.
3. Lay out the cable. Ensure that the cable reaches the terminal and is not pulled out during operation.
4. Attach the cable with the provided cable ties.
5. Secure the camera. Use the white cardboard drilling template from the quick start guide for this purpose.
6. Connect the camera to the terminal. Use the CAM port to do this.
7. Activate the camera. [➞ 43]
8. When disconnecting the cable from the terminal, use the enclosed rubber gasket to seal the exposed connector.

4.5 Connecting the ISO printer to the terminal

The ISO printer is used to print out information from an ISO-XML task.



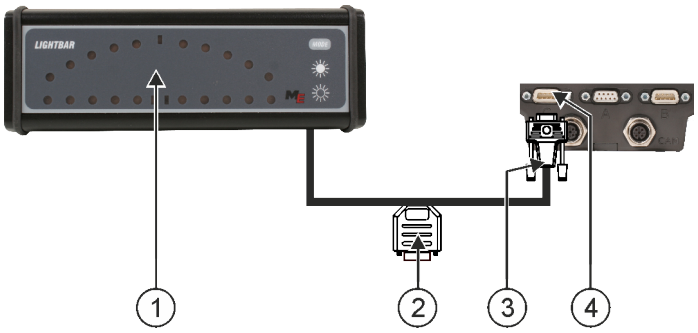
1	9-pin Sub-D plug for connection to ISOBUS	4	Plug for connection to ISO printer socket
2	ISO printer	5	Connector for connection to the terminal
3	ISO printer socket	6	CAN-Bus connection

When you connect a GPS receiver to the terminal, you must activate [→ 44] and configure it.

4.6 Connecting the ME LightBar to the terminal

The ME LightBar is a parallel guidance display made by Müller-Elektronik, which can be mounted near the windshield.

The ME LightBar works with position data and guidance lines that are provided by the TRACK Leader app. This is why you need the TRACK Leader app to be able to use the ME LightBar.



1	External LightBar	3	Connector for connection to the terminal
2	Plug for connecting a GPS receiver	4	Serial port RS232

After connecting an external LightBar to the terminal, you must activate [→ 44] it.

4.7 Connecting the on-board computer to the terminal

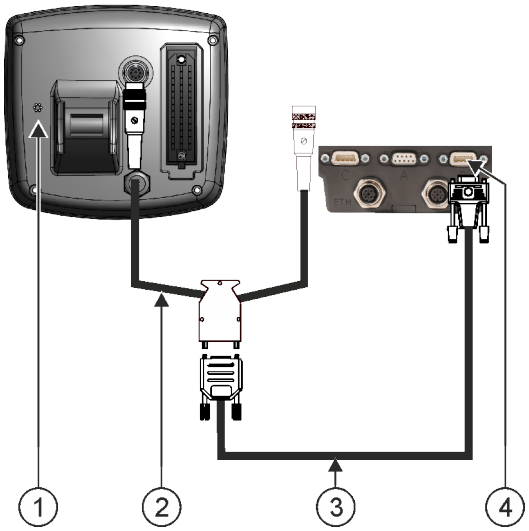
You can connect a range of on-board computers (non-ISO computers), which communicate using the LH5000 protocol or the ASD interface, to the terminal.

An appropriate connector cable for each on-board computer which can be connected is available from Müller-Elektronik. Our sales team will be glad to advise you.

You can find a list of on-board integrated display/controllers that we have tested here:

- Transfer target rates via LH5000 [→ 53]
- Switching sections and transferring target rates via ASD [→ 54]

For other on-board integrated display/controllers and for on-board integrated display/controllers with other software versions, this function may not work at all or different from how it is described in these instructions. Because the operating mode and configuration depends on the on-board integrated display/controller, Müller-Elektronik can unfortunately not help you with their set-up. You must contact the on-board integrated display/controller manufacturer for this.



1	On-board computer	3	Null modem cable
2	Adapter cable* Available as a set with Cable 3, item number: 3032254800	4	Port B on the terminal

*When using an Amatron3 or Amatron+ as on-board integrated display/controller, you will only need a traditional null modem cable. (Amatron3 and Amatron+ are on-board integrated display/controller from Amazone)

4.8 Connecting sensors to the terminal

The terminal provides you with the possibility of connecting a sensor or the tractor's 7-pole signal socket to port B. This allows you for example to use the working position signal in the TRACK-Leader parallel guide.

The working position sensor that can be purchased from Müller Elektronik is fitted with a round 3-pin plug. In order to connect this to the terminal, you will need an adapter cable.

Adaptor cable for the ME-sensor Y working position sensor

Adapter cable	Item number
3-pin to 9-pin	31302499

You can also connect the terminal to the signal socket.

Cable to the signal socket

Ports	Connection	Item number
7-pin to 9-pin socket	Cable direct to the signal socket Transmits the speed and working position.	30322548

5 Basic control principles

5.1 Initial start-up

You must at least perform the following settings during initial startup:

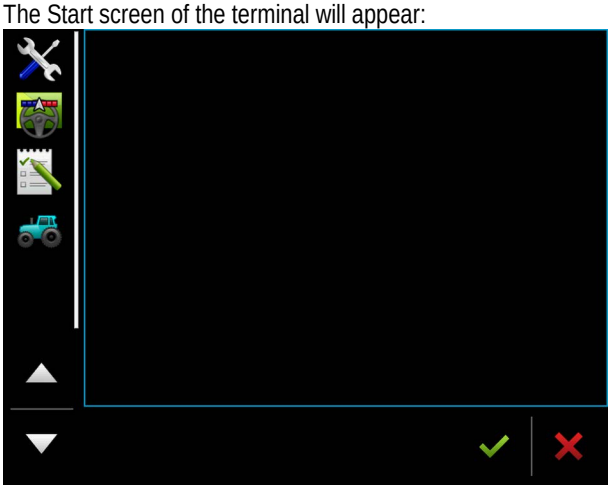
- Change the language [➞ 31].
- Configure the "Work with ISO-XML?" parameter in the ISOBUS-TC application [➞ 51].
- Configure the GPS receiver. [➞ 36]
- Enter the position of the GPS receiver [➞ 47].

Procedure

To switch on the terminal:

☑ The terminal is installed and connected to the ISOBUS basic vehicle harness.

1. Press and hold the button for approx. 3 seconds.
   ⇨ The terminal will beep briefly.
   ⇨ The terminal screen remains dark for approx. 10 seconds until the applications are loaded in the background.
   ⇨ The Start screen of the terminal will appear:



⇨ You have now started the terminal.

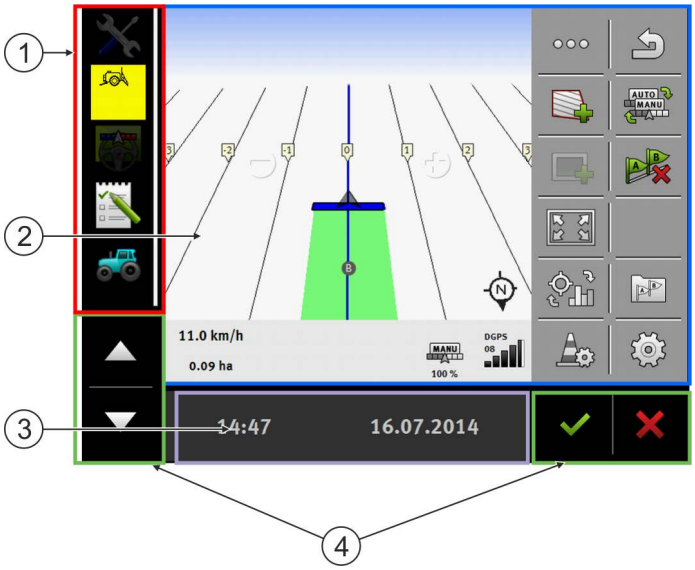
5.2 Switching off the terminal

Procedure

To switch off the terminal:

1. Press and hold the button for approx. 3 seconds.
   ⇨ You have now switched off the terminal.

5.3 Terminal screen layout



Terminal screen layout

1	Selection menu You can open applications in the "Selection menu" area.	3	Wide additional window
2	Main window This area enables you to operate applications. Touching the terminal screen in the "Main window" area will actuate the function whose icon you have touched. The controls depend on the opened applications.	4	System icons

System icons

Icon	Meaning
	Has no function in this area. When this icon appears in other areas, it is used for confirmation purposes.
	Has no function in this area. When this icon appears in other areas, it is used for cancellation or deletion purposes.
	Has no function in the current software version.
	Has no function in the current software version.

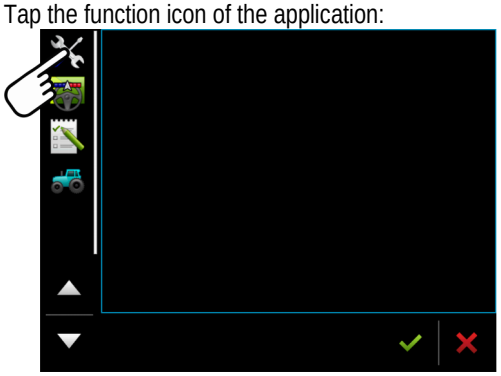
5.4 Opening applications

An application opens when it appears in the main window or in an additional window.

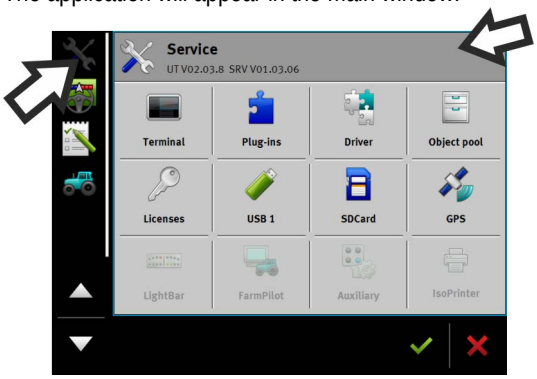
Procedure

To open an application:

1. Find the function icon for the desired application in the Selection menu area. For example, the icon:
2. Tap the function icon of the application:



⇨ The application will appear in the main window:



⇨ The function icon of the application in the Selection menu now appears darker. This tells you that this application is already open. You will no longer be able to open it from the Selection menu.

⇨ If the main window is occupied, the application that is already opened will be moved to a free additional window. If this is occupied, the application that is already opened will be moved back to the Selection menu. Their icon becomes bright again. However, it can continue to work in the background.

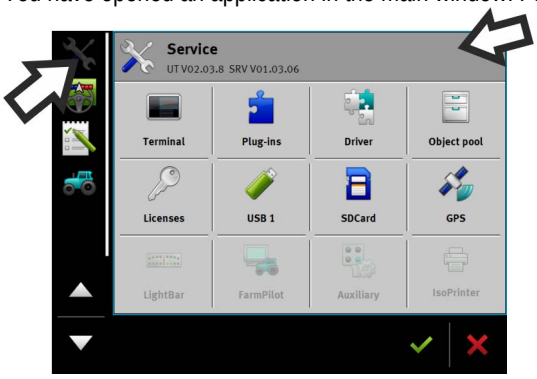
5.5 Moving an application

You can move any application from the main window to one of the additional windows or to the ME-Header.

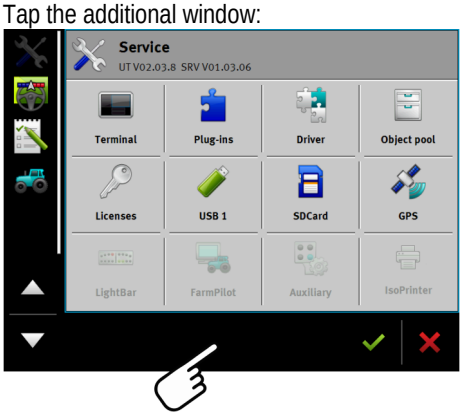
Procedure

To move an application from the main window to an additional window:

☑ You have opened an application in the main window. For example, the Service application:



1. Tap the additional window:



⇨ The application will now appear in the additional window:

2. Tap the additional window with the application.
   ⇨ The application will once again appear in the main window.

5.6 Saving and loading window arrangements

You can save and load the arrangement of the applications in the windows.

Procedure To save the arrangement:

1. Hold the button pressed down until the terminal beeps twice.

⇨ The arrangement will be saved.

Procedure To load a saved arrangement:

1. Briefly press the button:

⇨ The arrangement will be loaded.

5.7 Hiding an application

If you do not have enough space on the terminal screen to open new applications, you can hide an application. The application will not be shut down, but will instead continue to run in the background.

Procedure

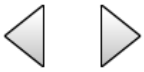
To hide an application:

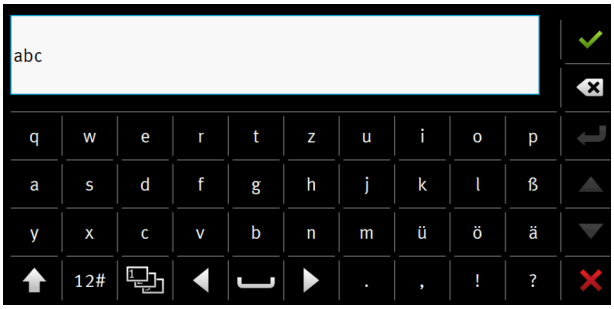
1. Open the application in the additional window.
2. Move the application to the selection menu.

5.8 Using the keyboard

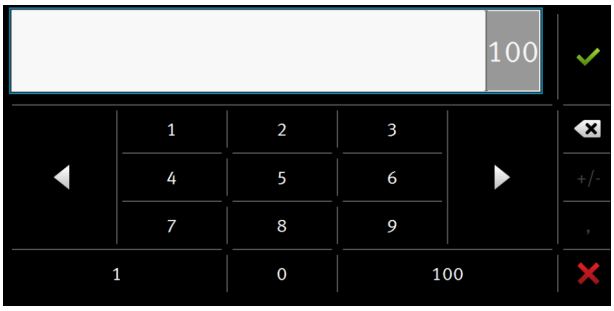
In order to enable you to also write numbers or text on the terminal, a keyboard will appear on the terminal screen whenever this is necessary.

Major icons

Icon	Meaning
12# Abc	Changes the buttons on the keyboard.
	Deletes a character.
	Moves the cursor.
	Saves the input.
	Cancels the input.
	Switches between upper and lower case letters.



Keyboard for inputting text and numbers.



Keyboard for inputting text.

5.9 Using a memory device

The terminal can work with two kinds of memory devices:

1. With a built-in Micro-SD card. This will be used as storage for most applications.
2. Using a USB memory device.

It is used only for the following purposes:

- For data transmission [➞ 28]
- For saving screen shots
- For working with shp files in the TRACK-Leader application.

farmpilot

If you use the farmpilot portal, do not use a USB memory device, but only the SD card.

5.9.1 Using a SD card

The terminals applications save most data [➞ 28] directly onto the SD card.

In order to exchange data between the terminal and a PC, you will need to proceed differently for each application. You can find out more about this in the instructions for each application.

Here is an overview of the directories on the USB memory device: Directories on the USB memory device [➞ 28]

5.9.2 Directories on the USB memory device

As soon as you insert the USB memory device into the terminal, various directories will be created on the terminal. You will need to set up other directories by yourself.

Each directory may only contain certain data, so that the applications on the terminal can use this data.

- "ApplicationMaps"
  - Files: Prescription maps in .shp format.
  - Purpose: TRACK-Leader. For use with "VARIABLE RATE-Control".
- "FIELDNav"
  - Files: .iio, .data
  - Purpose: Map material will be saved in this directory.
  - The directory will be created when the FIELD-Nav license is activated.

- "GIS"
  - Files: Field data, such as field boundaries, in the following formats: .shp, .dbf, .shx.
  - Purpose: TRACK-Leader. Export and import for GIS.
- "NgStore"
  - Files: .iio, .data
  - Purpose: TRACK-Leader. Standard directory for saved routes and fields.
- "Screencopy"
  - Files: .bmp
  - Purpose: Screenshots are saved here.
  - The terminal will create this directory automatically when the "Screenshot" parameter is activated in the "Terminal" menu and you create a screenshot.
- "Taskdata"
  - Files: .xml
  - Purpose: The directory may only contain XML files which originate from an ISO-XML compatible FMIS. The ISOBUS-TC application accesses this data.
  - You must create this directory yourself.
- "GPS"
  - Files: .txt
  - Purpose: GPS positions are saved in a file in the directory. This will enable Customer Service to reconstruct the traveled distance.
  - The directory will be created if you activate the "Record and save data" parameter.
- "fileserver"
  - Files: All file formats are acceptable.
  - Purpose: Files which are to be imported or exported in the File Server application are saved in this directory.
- "documents"
  - Files: .txt
  - Purpose: Records for all completed tasks are saved in this folder.

5.9.3 Displaying the content of the memory device on the terminal

You can view the content of the memory device directly on the terminal.

Procedure

1. Insert the memory device (USB memory device or SD card) into the terminal.
2. Open the "Service" application.
3. Tap on "USB 1" or on "SDCard".

⇨ The content of the USB memory device will be displayed.

⇨ The content of the SD card can be found in the "ME-TERMINAL" folder.

5.10 Using two terminals

When installing the terminal in a tractor in which there is already another terminal, you must configure both terminals so that communication works between both units.

The following table will tell you which settings you need to configure, and the chapters in which these are described.

Parameter	Chapter
ISOBUS-UT: Function instance	Basic settings [→ 31]
Login as ISOBUS-UT	Basic settings [→ 31]
Communication with ISOBUS-TC	Configuring the Tractor ECU [→ 45]
Configuring the list of connections	Configuring the list of connections [→ 51]

6 Configuring the terminal in the Service application

6.1 Changing the language

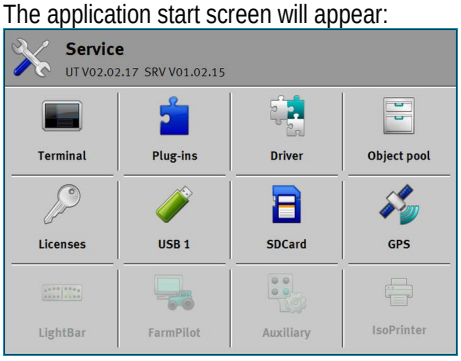
When you switch on the terminal for the first time, the text may appear in a foreign language (in German).

If you change the language in the Service application, you also change the language for all applications and the ISOBUS job computer.

If a connected ISOBUS job computer cannot activate the selected language, a standard language will be activated.

Procedure

1. - Open the Service application.
   ⇨ The application start screen will appear:



2. Tap "Terminal".
   ⇨ A list of parameters will appear.
3. Slide your finger over the terminal screen from the bottom to the top.
   ⇨ New parameters appear.
4. Tap "Language" ("Sprache").
   ⇨ A list of abbreviations of available languages will appear.
5. Tap the abbreviation for your language.
   ⇨ The abbreviation is marked with a green dot.
6. - Confirm.
   ⇨ The "Terminal" screen will appear.
7. Restart the terminal.

6.2 Basic settings

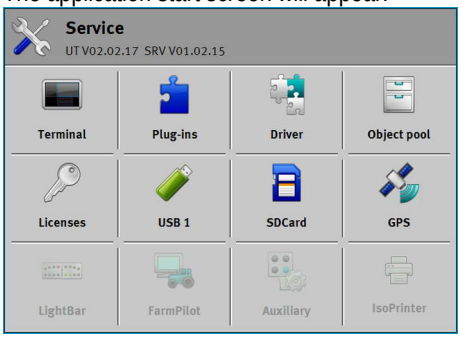
The basic settings include: Language, Time, Measurement units.

All settings which you make here will also apply to other applications and in connected ISOBUS job computers.

Procedure

1. - Open the Service application.

⇨ The application start screen will appear:



2. Tap "Terminal".
   ⇨ A list of parameters will appear. See the table below.
3. To change the value of any of the parameters, tap the desired parameter.
   ⇨ A window will appear, into which you can input the value of the parameter as a number, or select from a list.
4. - Confirm.
5. Restart the terminal.

Parameters in the "Terminal" menu

Parameter name	Function
Brightness Day	Brightness of the terminal screen during the day.
Brightness Night	Brightness of the terminal screen at night.
Keyboard brightness	Lighting of the buttons.
Volume	Volume of the terminal.
Date	Current date.
Time	Current time.
Time zone	Time difference in relation to GMT.
Language	Language of the applications on the terminal screen.
Measurement units	Measurement system.
Screenshot	When this parameter is activated, you can create screen shots on the terminal.
ISOBUS-UT: Function instance	Use this parameter if you want the ISOBUS interface to assign a specific "Function instance". This will enable you to set the terminal to which you want to connect an ISOBUS job computer.
Login as ISOBUS-UT	Activate this parameter if you want the ISOBUS job computer to be displayed on the terminal. This parameter must be activated in most instances. On very few self-propelled agricultural machines, the parameter must be deactivated.

Parameter name	Function
Number of navigation buttons	The terminal provides a maximum of 12 function icons in each application. When you connect an ISOBUS job computer that has more functions in a single screen to the terminal, their function icons are spread over multiple pages. Furthermore, navigation buttons appear that can be used to scroll to the next page. The number indicates how many buttons should be used to scroll between multiple pages with function icons.

6.3 Enabling and disabling applications

In the "Service" application you can activate and deactivate other applications that are installed on the terminal.

The applications are installed in packages, in so-called plug ins. A plug-in can contain several applications.

You can for example deactivate a plugin if you do not want to use it. The plug-in will then not be displayed in the selection menu.

Name of the plug-in	Includes the following applications
TRACK-Leader	TRACK-Leader SECTION-Control TRACK-Leader TOP VARIABLE RATE-Control
ISOBUS-TC	ISOBUS-TC
Tractor-ECU	Tractor-ECU
Camera	The terminal screen will show the image from the connected camera.
FIELD-Nav	FIELD-Nav
File Server	File Server
Serial Interface	Serial interface for the transfer of data to the on-board computer.

Procedure

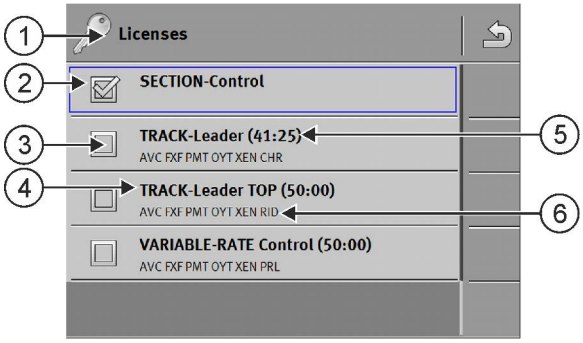
To activate and deactivate plug-ins:

1. - Open the Service application.
2. Tap "Plug-ins".
   ⇨ The "Plug-ins" screen will appear.
3. To activate or disable a plug-in, tap it.
   ⇨ A plug-in is activated when a checkmarker appears in front of its name.

4. Restart the terminal.

6.4 Unlocking licenses for full versions

Several applications are pre-installed on the terminal, which you can use for trial purposes for up to 50 hours. After this time has elapsed, they will be automatically deactivated.



"Licenses" screen

1	Screen name	4	Name of the application
2	Unlocked applications are marked with check marks.	5	You can see how long you can still use a test version in the brackets: in hours and minutes.
3	Un-checked applications are locked.	6	18-digit alphabetical code of the application

You will need an activation key to unlock a license. To receive this, you will need to purchase a license from Müller-Elektronik.

If you request the activation key by phone or by email, you will be required to give our staff the following information:

- The name of the application for which you require a license.
- The 18-digit alphabetical code of the application. You will find this on the "Licenses" screen.
- Serial number of the terminal – Found on the nameplate on the reverse of the terminal.
- Item number of the terminal – Found on the nameplate on the back of the terminal.

Procedure

To unlock a license:

1. - Open the Service application.
2. Tap "Licenses".
3. Order an activation key from Müller-Elektronik using the 18-digit alphabetical code.
4. Tap the name of the license that you want to unlock.
   ⇨ The keyboard will appear.
5. Enter the activation key.
6. - Confirm.
   ⇨ The "Licenses" screen will appear.
7. Restart the terminal.

⇨ The full version of the application is now unlocked.

6.5 GPS receiver

When you connect a GPS receiver to the terminal, you must activate and configure it.

6.5.1 Activating the GPS receiver

In order to enable the GPS receiver, you must first select the driver for the connected receiver.

A driver is a small program that controls connected device. The drivers for the devices supplied by Müller-Elektronik are pre-installed on the terminal.

Available drivers

Driver name	GPS receiver
deactivated	No GPS receiver is connected.
A100, A101	Drivers for the A100 and A101 GPS receivers from Müller-Elektronik, if they are connected to the serial interface.
AG-STAR, SMART-6L	Drivers for the AG-STAR and SMART-6L GPS receivers from Müller-Elektronik, if they are connected to the serial interface.
PSR CAN	Select this driver if the GPS receiver is connected to the PSR steering job computer. PSR is a steering computer by the Reichhardt company. The signals are transmitted to the terminal through the CAN cable. The receiver will be configured directly in the PSR application.
Standard	Drivers for unknown GPS receivers, if they are connected to the serial interface. This driver is activated by default. The connected GPS receiver cannot thus be configured.
TRACK-Leader AUTO®	Select this driver if a GPS receiver is connected to the TRACK-Leader AUTO® steering job computer.

CAUTION

Incorrect driver
Damage to the GPS receiver.

- Before connecting a GPS receiver to the terminal, you must always activate the appropriate driver.

Procedure

To activate the driver:

1. - Open the Service application.
2. Tap "Driver".
3. Tap "GPS".
   ⇨ The installed drivers will appear.

4. Tap the appropriate driver.
5. - Confirm.
6. Restart the terminal.

6.5.2 Configuring the GPS receiver

The internal software for each GPS receiver must be configured. You can configure the following GPS receivers offered by Müller-Elektronik via the terminal:

- A100, A101
- AG-STAR, SMART-6L

All other GPS receivers must be configured in accordance with their manufacturer's instructions.

Function icon	Meaning
	Reads the configuration of the GPS receiver.
	Restores the manufacturer's default settings.
	Opens the license menu. [→ 38] Only appears for a SMART-6L DGPS/Glonass receiver for entering an activation license.

Procedure

☑ The GPS receiver is connected to the terminal.

☑ The GPS receiver is connected directly to the terminal. Additional devices such as an ME LightBar or tilt module may not be connected in between.

☑ The correct GPS driver is activated.

1. - Open the Service application.
2. Tap "GPS".
   ⇨ The "Settings" screen appears.
   ⇨ The following message will appear during initial configuration: "GPS receiver identified. Read the configuration?"
3. To confirm, tap "Yes". To cancel, tap "No".
   ⇨ The terminal reads the current configuration of the GPS receiver.
   ⇨ You can now see all of the configurable parameters.
4. Reconnect all of the additional devices that you had disconnected for the configuration.

Parameters for the GPS receiver

Baud rate

Only appears when the "Standard" driver is selected.

Setting for the speed at which the GPS receiver sends data to the terminal. The parameter sets the baud rate for the terminal.

Satellite 1 and Satellite 2

Satellite 1 – primary DGPS satellite. The DGPS receiver will connect to this satellite in the first instance.

Satellite 2 – secondary DGPS satellite. The DGPS receiver will only connect to this satellite in the event that the primary satellite fails.

Your satellite selection will depend on which satellite currently has the best availability in your region.

Potential values:

- "Auto"
  The software automatically selects the current best satellite. This setting is not recommended, as it slows down the start-up of the DGPS receiver.
- Name of the satellite. Which satellites are shown here is dependent on the driver and correction signal that you have activated.

Steering

This parameter activates the "Automatic steering" assistance function in the GPS receiver.

If you want to connect your existing GPS receiver to a steering job computer, you have to configure the "Steering" parameter.

Potential values:

- "Without automatic steering"
  Deactivates automatic steering assistance.
- "TRACK-Leader TOP"
  Activates automatic steering assistance with TRACK-Leader TOP.
- "TRACK-Leader AUTO"
  Activates automatic steering assistance with TRACK-Leader AUTO.

Correction signal

Type of correction signal for the DGPS receiver.

The correction signals which are available is dependent on the activated driver.

Potential values:

- For the "A100, A101" driver:
  - "WAAS/EGNOS"

    Correction signal for Europe, North America, Russia and Japan.
  - "E-DIF"

    Internal calculation of correction data.

    Only functions with a special version of the A100 DGPS receiver, item no. 30302464. This receiver is no longer sold by Müller-Elektronik.
- For the "AG-STAR, SMART-6L" driver
  When a AG-STAR DGPS/Glonass receiver is connected:
  - "EGNOS-EU"
  - "WAAS-US"
  - "MSAS-JP"
  - "EGNOS-EU + GL1DE"
  - "WAAS-US + GL1DE"
  - "MSAS-JP + GL1DE"

- "GPS/Glonass GL1DE 1"
- "GPS/Glonass GL1DE 2"

When a SMART-6L DGPS/Glonass receiver is connected:

- EGNOS/WAAS
- EGNOS/WAAS + GL1DE
- GL1DE
- RTK radio (RTK license required [→ 38])
- RTK GSM (RTK license required [→ 38])

Terrain compensation

The GPS TILT-Module terrain compensation is configured using this parameter.

You can order the terrain compensation from Müller-Elektronik with the following item number: 30302495.

RTK license for SMART-6L

You will need a SMART-6L DGPS/Glonass receiver and RTK license in order to work with RTK correction signals.

When purchasing a GPS receiver with an RTK license, the licence from Müller-Elektronik will be entered. You only have to enter the licence yourself when it is purchased at a later date.

Procedure

1. - Open the Service application.
2. Tap "GPS".
   ⇨ The "Settings" screen will appear.
3. - Open the license menu.
4. Tap "License code".
   ⇨ The "License menu" screen will appear.
   ⇨ You can see the serial number and firmware version on the screen. You will need these when ordering the license code.
5. Enter the license code.
6. - Confirm.

GSM modem for SMART-6L

If you are using the DGPS/Glonass SMART-6L receiver with a GSM modem, you can adjust the existing configuration.

Procedure

1. - Open the Service application.
2. Tap "GPS".
3. The "Settings" screen appears.
4.

- Open the configuration menu.

5. Configure the parameters. The explanations for the individual parameters can be found in the table at the end of this section.
6. - Save the changes.
   ⇨ The following message appears: "Should the data be transmitted to the modem?"
7. "Yes" - to confirm.
   ⇨ The data are being transmitted to the modem. This will take approx. 30 seconds.

⇨ After a restart, the new data will be displayed on the "NTRIP configuration" screen.

Parameter	Meaning	Possible entries
APN	Connection to the provider.	Provider URL or IP address.
User	Name for the Internet access. The name is the same for all users of a provider.	Name that was given by the provider. Some providers do not require entering a name.
Password	Password for the Internet access. The password is the same for all users of a provider.	Password that was given by the provider. Some providers do not require entering a password.
URL/IP	Connection to the correction data server.	Correction data server URL or IP address.
Port	Port at the correction data server.	Port number
NTRIP user	Name from the correction service to identify the customer account.	Letters and numbers. Pay attention to the use of upper and lower case letters.
NTRIP password	Password for the identification name.	Letters and numbers. Pay attention to the use of upper and lower case letters.
Mountpoint	Manual entry of a correction data source, only possible with GPRS connections.	Name of the correction data source / data stream.

Configuring AG-STAR and SMART-6L GPS receivers for automatic steering

To be able to use a GPS receiver with automatic steering, it must previously be configured for this use. The configuration adjusts the internal settings of the GPS receiver.

Procedure

This is how to configure the GPS receiver for automatic steering:

1. Activate the "AG-STAR, SMART-6L" driver [→ 35] to establish a connection between the terminal and the GPS receiver.
2. Configure the GPS receiver. [→ 36]
3. Tap "Steering" in the configuration.
4. Select the automatic steering that you are using.
5. - Confirm.
6. For TRACK-Leader AUTO® systems, tap and adjust the baud rate of the receiver to the automatic steering.

⇨ The following message appears: "You can now disconnect the GPS receiver."

7. Confirm using "OK".
8. Switch off the terminal.
9. Now connect the GPS receiver to the cable harness of the steering job computer.
10. Start the terminal.
11. Depending on the steering job computer, activate the "PSR CAN" or "TRACK-Leader AUTO" driver. [➞ 35]
12. - Confirm.
13. Restart the terminal.

⇨ The GPS receiver is now configured for automatic steering.

To change parameters for the GPS receiver after the GPS receiver has been configured for automatic steering, you must restore the internal settings of the GPS receiver.

Procedure

1. Connect the GPS receiver to the terminal.
2. Activate the "AG-STAR, SMART-6L" driver. [➞ 35]
3. Restart the terminal.
4. - Open the Service application.
5. Tap "GPS".
6. - Reset the baud rate.
7. The following message appears: "Should the standard baud rate be restored?"
8. Confirm using "OK".
9. Restart the terminal.

⇨ You can now change the individual parameters for the GPS receiver.

⇨ After you have changed the parameters, you can reconfigure the GPS receiver for the steering.

6.5.3 Recording GPS positions

Certain faults can require the recording of communications between the GPS receiver and the terminal.

Procedure

☑ A USB memory device is inserted into the terminal.

1. - Open the Service application.
2. Tap "GPS".
3. Tap "GPS-Data".
   ⇨ The "GPS-Data" screen will appear.
4. Scroll down.
5. Tap "Trace-Data".
   ⇨ The "Trace-Data" screen will appear.

6. Scroll down.
7. Checkmark the "Record and save data" button.
   ⇨ The terminal will immediately begin to record the data. This will be saved in the "GPS" directory on the USB memory device.
   ⇨ The function will be deactivated following any restart.

6.6 Configuring the "GPS TILT-Module" terrain compensation

Procedure

☑ The "GPS TILT-Module" terrain compensation is connected.

☑ The tractor is positioned on level ground.

☑ The driver of the external ME LightBar is deactivated.

1. If any additional devices (z.B. ME LightBar) are connected to the cable between the terminal and the tilt module, disconnect them. The tilt module must be connected directly to the terminal. After the tilt module has been configured, these additional devices must be reconnected.
2. Measure the distance between the GPS receiver and the ground on which the tractor is positioned.
3. Switch on the terminal.
4. - Open the Service application.
5. Tap "GPS".
   ⇨ The "Settings" screen appears.
6. Scroll down until the "Terrain Compensation" parameter appears on the screen.
7. Tap "Terrain Compensation".
8. Enter the measured distance on the "GPS receiver height" line.
9. Tap .
   ⇨ Message: "Tilt module will be configured." is displayed.
10. To confirm, tap "Yes".
    ⇨ The position of the tilt module on level ground is being calibrated.
    ⇨ After calibration, the angle 0 will appear on the "Angle" line. The displayed angle will change with any tilt of the tractor.
11. Reconnect all of the additional devices that you had disconnected for the configuration.

6.7 Creating screenshots

A screenshot is a photo of the screen being displayed.

Procedure

1. Insert a USB memory device into the terminal.
2. - Open the Service application.
3. Tap "Terminal".
4. Set the "Screenshot" parameter to "Activated".
5. To create a screenshot, press the button.

⇨ The content of the terminal screen will be saved as an image file on the USB memory device in the "Screencopy" folder.

6.8 Deleting pools

Pools are the intermediate storage for the terminal. Pools are used to temporarily store graphics or text. Over time, the pools will become too large and slow down the operation of the terminal.

You can delete the pools to speed up the terminal's operation.

When to delete?

Delete the pools:

- After updating the software of a connected job computer.
- If the terminal operates more slowly than usual.
- When asked to do so by Customer Services.

Procedure

To delete the pools:

1. - Open the Service application.
2. Tap "Object pool".
   ⇨ A list with the ISO names of ISOBUS job computers will appear, whose graphics and text can be found in the storage of the terminal. You can determine from the icon which farm implement is being controlled by the job computer.
3. Tap the object pool which you want to delete.
4. - Delete the object pool.
   ⇨ Don't worry if you delete the wrong object pool. it will be reloaded.
   ⇨ The following message will appear: "Do you want to delete the directory?"
5. To confirm, tap "Yes".
6. The current pool of the job computer will be loaded after the next restart.

6.9 Configuring the joystick button allocations

The terminal offers you the possibility of assigning the functions of an ISOBUS job computer to the buttons of the joystick. To do so, the ISOBUS job computer and the joystick must fulfil the Auxiliary 2 specification requirements from the ISOBUS standard.

Procedure

To activate the driver for this function:

☑ The joystick and ISOBUS job computer are connected and both support the Auxiliary 2 protocol.

1. - Open the Service application.
2. Tap "Driver".
3. Tap "Auxiliary".
4. Mark "Auxiliary2".
5. - Confirm.
6. Restart the terminal.

Procedure

To configure the button assignment:

☑ You have activated the driver "Auxiliary2"

1. - Open the Service application.
2. Tap "Auxiliary".
3. Tap "Auxiliary Editor".
   ⇨ If the ISOBUS job computer supports the Auxiliary 2 protocol, a list will appear of the job computer functions.
   ⇨ If no list appears, the ISOBUS job computer does not support this protocol.
4. Tap the function which you want to assign to this button on the joystick.
   ⇨ A list of the buttons on the joystick will appear.
5. Select the button to which the selected function should be assigned.
6. - Confirm.
   ⇨ A list of assignments will appear.
7. Restart the terminal.
   ⇨ After restarting, the following notification will appear on the main terminal screen: "Confirm the assignments." This notification will appear after any restart.
8. "OK" - acknowledge the notification.
   ⇨ A list of recognized assignments will appear on the terminal screen.
9. - Confirm the assignments.

6.10 Camera

6.10.1 Activating a camera

In order to activate a camera, you must activate the "Camera_ME" plug-in.

Procedure

1. - Open the Service application.
2. Tap "Plug-ins".
3. Tap "Camera".
   ⇨ The plug-in is marked with a green tick.
4. Restart the terminal.
   ⇨ After restarting, the icon for the camera application will appear in the selection menu.
5. - Open the Camera application.

6.10.2 Operating the camera

Function icon	Meaning
	Mirrors the image horizontally.

Function icon	Meaning
	Mirrors the image vertically.

☑ You have connected and activated the camera.

1. - Open the Camera application.
   ⇨ The image will appear in the main window.
2. Tap on the main window.
   ⇨ Function icons will appear on the side for 10 seconds, with which you can actuate the camera.

6.11 Activating the ISO printer

In order to activate the ISO printer, you must activate its driver.

Procedure

1. - Open the Service application.
2. Tap "Driver".
3. Tap "ISOPrinter".
   ⇨ The installed drivers will appear.
4. Tap "ISO Printer".
5. - Confirm.
6. Restart the terminal.

6.12 Activating an external LightBar

If you connected an external LightBar to the terminal, you must activate it.

To activate the external LightBar, you must first activate its driver.

You can order the external LightBar from Müller-Elektronik with the following item number: 30302490.

Procedure

1. - Open the Service application.
2. Tap "Driver".
3. Tap "LightBar".
   ⇨ The installed drivers will appear.
4. Tap "Lightbar".
5. - Confirm.
6. Restart the terminal.

7 Tractor-ECU application

The Tractor-ECU application is used to compile all of the information of the vehicle on which the terminal is mounted. Tractor-ECU can transfer this information to other apps (e.g. the position of the GPS receiver to TRACK-Leader or SECTION-Control) or to a connected ISOBUS job computer (GPS signal as a speed source).

The Tractor-ECU application allows you to:

- Input the sensors which are mounted on the vehicle.
- Input the position of the GPS receiver.
- Define the GPS signal to determine the speed on the CAN bus.

7.1 Configuring the Tractor ECU

Procedure

1. - Open the Tractor ECU application.
2. Tap "Settings".
   ⇨ The parameters are displayed.

Parameters in a vehicle profile

Connection with ISOBUS-TC?

With this parameter, you can set whether the Tractor ECU application should communicate with the ISOBUS-TC application. In doing so, it transmits: Counters, working position, position of the GPS receiver.

Deactivate this parameter only if the terminal is used as a secondary terminal and the GPS receiver is connected to a different terminal.

Speed

Configuring the speed sensor. This measures the speed.

Potential values:

- "disabled"
  No sensor measures the speed.
- "Wheel sensor"
  A wheel sensor is connected to the terminal. The wheel sensor must be calibrated [→ 47].
- "Radar sensor"
  A radar sensor is connected to the terminal. The radar sensor must be calibrated [→ 47].
- "GPS receiver"
  The speed is calculated using GPS.
- "Unknown sensor via CAN"
  A wheel sensor or a radar sensor is connected to the terminal via CAN.
- "Radar sensor via CAN"
  A radar sensor is connected to the terminal via CAN.
- "Wheel sensor via CAN"
  A wheel sensor is connected to the terminal via CAN.

Working width

This value is transmitted to the ISOBUS-TC application to calculate the processed area.

This parameter primarily enables you to document processed areas for non-ISOBUS implements if you are working in TRACK-Leader without an ISOBUS job computer, and if you also use the ISOBUS-TC app simultaneously with ISO-XML tasks.

In this case, no implement data is normally transmitted to ISOBUS-TC. To enable calculation of the processed areas in the Farm Management Information System at a later time, you can enter the working width here.

You can only then use this function if you also have an operating position sensor.

Remember to set a new working width after working with a non-ISOBUS implement.

Pulses per 100 meters

This parameter is only required if you have selected one of the following speed sources: Wheel sensor or radar sensor. In other cases, any value entered here will be ignored.

The speed sensor calibration results appear under this parameter. See:

Working position sensor

With this parameter, you can set whether there is a working position sensor and how its signal reaches the terminal.

There are three parameters that can be used to configure the working position sensor:

"Mounting position and connection" parameter

Potential values:

- "deactivated"
  No sensor measuring the working position.
- "Front via connector B"
  A working position sensor, is located on the front hoist or on the implement mounted on the front hoist. It is connected to the terminal via connector B. The working position sensor must be configured.
- "Rear via connector B"
  A working position sensor, is located on the rear hoist or on the implement mounted on the front hoist. It is connected to the terminal via connector B. The working position sensor must be configured.
- "Unknown sensor via CAN"
  There is a working position sensor determining the working position of the implement. It is connected to an ISOBUS job computer or to a different terminal. The signal reaches the terminal via CAN.
- "Front via CAN"
  There is a working position sensor determining the working position of the implement at the front of the vehicle. It is connected to an ISOBUS job computer or to a different terminal. The signal reaches the terminal via CAN.
- "Rear via CAN"
  There is a working position sensor determining the working position of the implement at the rear of the vehicle. It is connected to an ISOBUS job computer or to a different terminal. The signal reaches the terminal via CAN.

"Sensor type" parameter

If a working position sensor is connected to the terminal via connector B, you must tell the terminal the principle according to which the sensor functions.

Potential values:

- "analog"
  You are using an analog working position sensor [→ 49], which measures the height of the hitch linkage as a percentage.
- "digital"
  You are using a digital, ISO-compatible working position sensor in accordance with ISO 11786. The sensor is connected to the terminal via the signal socket.
- "ME-sensor Y"
  You are using a working position sensor provided by Müller-Electronik. The sensor is connected to the terminal.

"Inversion" parameter

As a standard, the terminal assumes that the implement is in working position as soon as the working position sensor sends a signal. However, if the working position sensor functions inversely, you have to set it here.

Potential values:

- "Yes" - implement is in working position when the sensor is not occupied.
- "No" - implement is in working position when the sensor is occupied.

7.1.1 Calibrating the speed sensor

When calibrating the speed sensor using the 328.085ft (100m) method, determine the number of impulses which the speed sensor encounters over a distance of 328.085ft (100m).

If you know the number of impulses for the speed sensor, you can also input this manually.

Procedure

☑ You have measured and marked a distance of 100m. The distance must correspond to the field conditions. You must therefore drive across a meadow or a field.

☑ The vehicle with the connected machine is operational for a 100m drive and is at the start of the marked distance.

☑ You have connected a wheel sensor or radar sensor to the terminal.

☑ You have selected the value "Wheel sensor" or "Radar sensor" in the "Speed" parameter.

1. Open the Tractor ECU application.
2. Tap "Settings".
3. Tap

.
4. Follow the instructions on the display screen.

⇨ You have calibrated the speed sensor.

7.1.2 Entering the position of the GPS receiver

When you have mounted and connected the GPS receiver, you must enter its exact position.

In order to enter an accurate position for the GPS receiver, you must measure the distances of the GPS receiver from the longitudinal axis and from the so-called attachment point [→ 48].

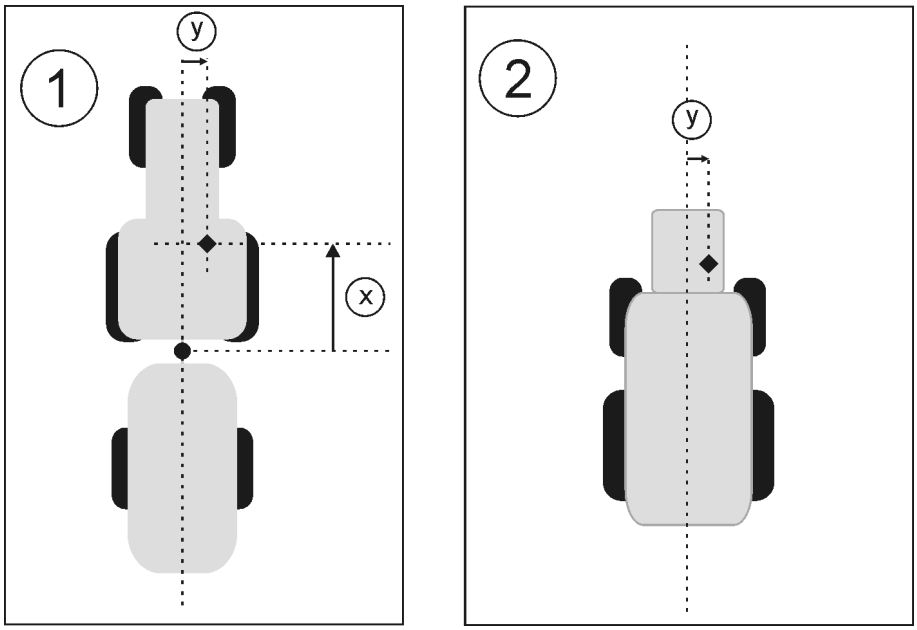
When entering distances, please note that it is essential to specify whether the GPS receiver is to the left or right of the tractor's longitudinal axis and whether it is positioned before or after the attachment point.

What is the position of the GPS receiver?	The distance should be entered as follows
to the right of the longitudinal axis	y
to the left of the longitudinal axis	- y
before the attachment point	x
after the attachment point	- x

NOTICE

If you are using TRACK-Leader AUTO® automatic steering, pay attention to the following:
The lateral shift of the GPS receiver from the centre is also entered in the steering job computer. This value will be added to the value in the Tractor ECU app and to the value in the implement profile (TRACK-Leader app).
For this reason:

- Mount the GPS receiver at a central position (left-right-axis) on the vehicle. By doing this, you avoid many problems that arise from the positioning of the GPS receiver.
- If this is not possible: As soon as you switch on the TRACK-Leader AUTO® steering job computer, make sure that the lateral shift of the GPS receiver is set to 0 cm at the following points: in the Tractor ECU app and in the machine profile of the implement used in TRACK-Leader.



GPS receiver for ISOBUS machines

●	Attachment point for mounted or trailed implements	◆	GPS receiver
(1)	Mounted or trailed implements	(2)	Self-propelled machines
y	Distance between the longitudinal axis and the GPS receiver for Offset Y	x	Distance for Offset X

7.1.3 Calibrating an analog working position sensor

If you have connected an analog working position sensor to the terminal, you have to show the terminal the position as of which the implement is in working position.

Procedure

☑ You have connected a working position sensor directly to the terminal or via the signal socket to the terminal.

☑ You have selected the analog sensor in the "Sensor type" parameter.

1. Open the Tractor ECU application.
2. Tap "Settings".
3. Move the implement into working position.
4. Tap to record the working position.

⇨ You have configured the working position sensor.

7.2 Results

The Tractor ECU application documents the work in two counter groups:

- Daily counter
- Task-related counter

7.2.1 Daily counter

Counter designation	This is documented
Applied distance	Distance during which the working position sensor was activated.
Applied area	Area during which the working position sensor was activated. The Tractor ECU application uses the set working width as a basis for the calculation of the area.
Working time	Time during which the working position sensor was activated.

Procedure

To clear a daily counter:

1. - Open the Tractor ECU application.
2. Tap "Information".
   ⇨ The "Results" screen appears with the daily counters.
3. Tap the function icons to clear the daily counters.

Icon	This counter will be erased
	Applied distance
	Applied area
	Working time
	All daily counters

7.2.2 Task-related counter

These counters are transmitted to the ISOBUS-TC app. You can activate the counters in a task, and they will then appear in the additional window as soon as the ISOBUS-TC app is minimized.

Task-related counter

Counter designation	Unit	This is documented
Working width	m	Working width from the Tractor ECU
Distance	km	Distance during which the working position sensor was activated.
Area	ha	Area during which the working position sensor was activated. The Tractor ECU application uses the set working width as a basis for the calculation of the area.
Time in working position	h	Time during which the working position sensor was activated.
Working position	0/1	0 = not in working position 1 = in working position

8 ISOBUS-TC task processing

8.1 Using ISOBUS-TC

The ISOBUS-TC application is an application from Mueller-Electronics which establishes an interface between the ISOBUS job computer, the TRACK-Leader application and the FMIS (Farm Management Information System) on the ISOBUS terminal.

With ISOBUS-TC, you can:

- Plan and edit ISO-XML tasks on the terminal,
- Edit ISO-XML tasks which you have planned on the PC using your FMIS.

All information contained in the order will be transferred by ISOBUS-TC to specialized applications of the terminal. This means that each application is doing exactly what it can do best:

- The field boundaries, guidance lines, prescription maps and other information about processed fields stored in the task are transferred to TRACK-Leader. The field can be therefore processed.
- The target rates are transferred from a prescription map to the ISOBUS job computer. In this way, you do not have to worry about inputting the target rates.
- ISOBUS-TC documents work duration, and the persons, implements and resources involved.
- After completing the work, you can transmit all of the work results to a PC. To do so, you can either use a USB memory device or the farmpilot Internet portal - if it is available in your country.
- After completing the work, you can move all of the work results to a USB memory device to edit the data on a PC.

8.2 Adjusting how you use ISOBUS-TC

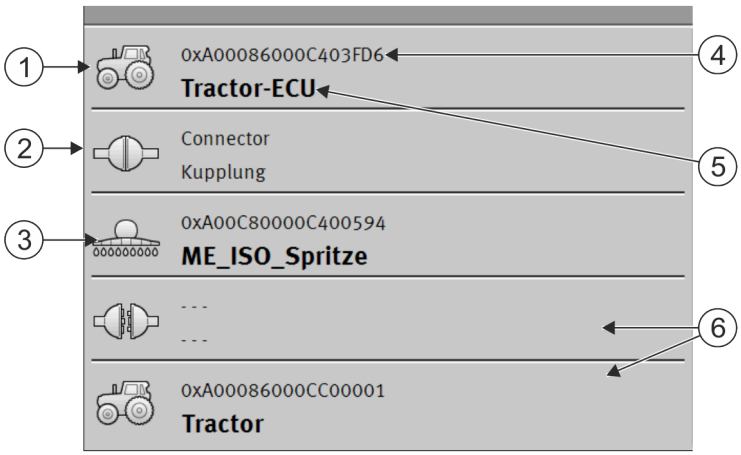
First of all, you must decide how you will use the ISOBUS-TC application. The operation of ISOBUS-TC and TRACK-Leader is dependent on this setting.

Procedure

1. - Open the ISOBUS-TC application.
2. Tap "Settings".
3. Tap "Work with ISO-XML?".
4. Tap "Yes" if you want to work with tasks. Tap "No" if you do not want to use tasks or the ISOBUS-TC application.
5. - Confirm.
   ⇨ You will be asked whether you want to change the setting.
6. Tap "Yes" if you want to confirm this.
7. Wait until all messages have faded out.
8. Restart the terminal.

8.3 Configuring the list of connections

The list of connections indicates the ISOBUS job computers from which the terminal will load the geometries of the connected implements. This geometry is required in order to calculate the position of all implement components on the basis of the GPS signal. Only in this way are precise parallel driving and section switching possible.



The farm equipment must be ordered consecutively from the front to the rear when viewed in the direction of travel

1	Tractor job computer icon In this case, it is the Tractor-ECU application of the terminal.	4	ISO number for the ISOBUS job computer
2	There is a connection between "Tractor-ECU" and "ME_ISO_Spritze". - connected implements.	5	Name of the job computer
3	Icon for the "ME_ISO_Spritze" ISOBUS job computer	6	Not all of the equipment in the list must be connected. Job computers which contain no relevant geometric data can be disconnected. In the image, the "Tractor" job computer has been disconnected, as the tractor geometry should be transferred from the Tractor-ECU application of the terminal. - disconnected implements.

Procedure

If you are using the ISOBUS-TC application, you can configure the list of connections as follows:

In simple systems, the terminal can set up the list of connections automatically. In particular, when the ME terminal is the only unit containing the tractor geometry (see: Entering the position of the GPS receiver [➞ 47])

It can however still be necessary to set the list of connection manually in the following instances:

- If a tractor job computer (Tractor-ECU), in which the tractor geometry is saved, is mounted as an independent job computer on the tractor. In this instance, you must decide which Tractor-ECU is connected in the list of connections with other equipment: the application on the ME terminal or on the tractor job computer.
- If the system cannot organize the ISOBUS job computer by itself. For example when more than one implement is connected to the tractor (e.g.: slurry tanker and planter/seeder).
- When the connection to an ISOBUS job computer is interrupted during the start-up of a ISO-XML task. In most cases, the list of connections will be set correctly as soon as you reconnect the ISOBUS job computer.
- If this error message appears when starting the terminal: "List of connection is incomplete."
- When the following error message appears when starting a navigation in TRACK-Leader: "The device data is still loading." The settings in the list of connections can eliminate this problem.

9 Serial Interface application

The "Serial Interface" application is used to enable communication between the terminal and a non-ISOBUS compatible on-board computer.

This interface enables you to use all of the applications together with the GPS signal and the on-board computers, in order to:

- Transfer target rates (using the LH-5000 protocol or the ASD protocol); [➙ 53]
- Switch sections on and off (using the ASD protocol). [➙ 54]

So that you do not need to reconfigure the application each time, you can create an individual profile for each on-board computer.

9.1 Transfer target rates via LH5000

Tested on-board computer*

Manufacturer	On-board computer	Software version	Baud rate
RAUCH	Quantron A	V1.20.00	9600
RAUCH	Quantron E	V3.51.00	9600
RAUCH	Quantron E2	V2.10.00	9600
RAUCH	Quantron S	V3.90.00	9600
RAUCH	Quantron S2	V1.00.05	9600
ME	Spraylight	V02.00.10	9600

* - Only on-board computers on which we were able to determine that the serial interface was functional are listed. Results may differ with different software versions.

Procedure

☑ You have checked whether you need to activate the LH5000 protocol on the on-board computer. If yes, you have activated the protocol.

☑ The "Serial Interface" plug-in is activated.

1. Connect the on-board computer to the terminal. [➙ 20]
2. Start the terminal.
3. - Open the Serial Interface application.
4. Tap "Settings".
5. - Add a new ag equipment profile.
   ⇨ A new ag equipment profile appears on the screen.
6. Configure the parameters as shown in the following steps.
7. "Operating Mode" -> "Target Rate Transfer"
8. "Protocol" -> "LH5000"
9. "Implement type" -> Select the implement with which you are working.

10. "Baud rate" -> normally "9600". The baud rate is dependent on the on-board computer.
11. - Activate the ag equipment profile.
12. - Press and confirm in order to save the ag equipment profile.
13. Restart the terminal.

Further steps

You have set up the serial interface. You must now configure the applications of the terminal.

In the TRACK-Leader application:

1. Deactivate the "SECTION-Control" parameter under "Settings / General".
2. Create a ag equipment profile for the combination of your tractor and mounted implement.
3. Load a prescription map.

You can load the prescription map in two ways:
- As a shp file, in the TRACK-Leader application.
- As part of a ISO-XML task, if you are using the ISOBUS-TC application and a FMIS.

For more information, please refer to the TRACK-Leader and ISOBUS-TC operating instructions.

9.2 Switching sections and transferring target rates via ASD

Tested on-board integrated display/controllers*

Manufacturer	On-board display/controller	Software version	Baud rate	Target rate transmission	Section control
Amazone	Amatron3	V1.09.00	19200	+	-
Amazone	Amatron+	V3.23.00	19200	+	-
RAUCH	Quantron A	V1.20.00	19200**	-	+
RAUCH	Quantron E	V3.51.00	19200**	+	+
RAUCH	Quantron E2	V2.10.00	19200**	+	+
Müller-Elektronik	Spraylight	V02.00.13	19200	+	+
Müller-Elektronik	DRILL-Control	-	19200	+	+

* - Only on-board integrated display/controllers are listed for which we were able to determine that the serial interface was functional. Results may differ with different software versions.

** - "GPS Control" must be activated on the on-board integrated display/controller

You can use the ASD protocol to transfer target rates to a prescription map or to switch sections. The degree to which you can use these functions will depend on the on-board computer.

In order to be able to perform transfers using the ASD protocol, you will need to activate the "ASD-Protocol" license.

Procedure

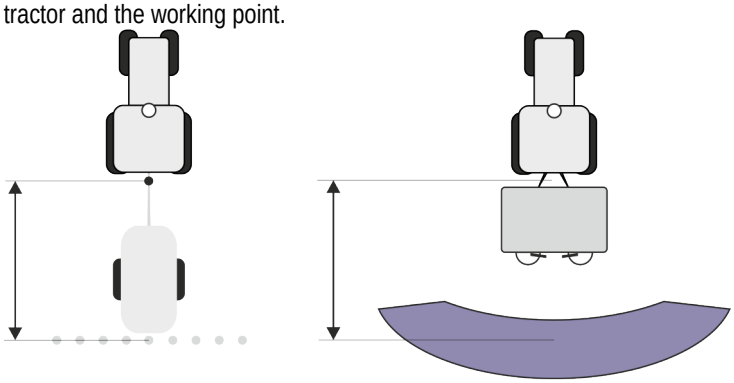
To configure the serial interface in order to switch sections using your on-board computer:

☑ You have activated the "SECTION-Control" parameter in the "General" menu of the TRACK-Leader application.

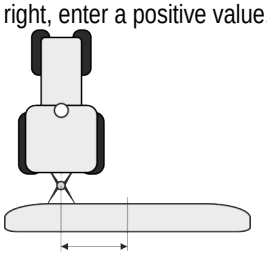
☑ You have checked whether you need to activate the ASD protocol on the on-board computer. If yes, you have activated the protocol.

☑ The "Serial Interface" plug-in is activated.

1. Connect the on-board computer to the terminal. [➙ 20]
2. Start the terminal.
3. - Open the Serial Interface application.
4. Tap "Settings".
5. - Add a new ag equipment profile.
   ⇨ A new ag equipment profile appears on the screen.
6. Configure the parameters as shown in the following steps.
7. "Operating Mode" -> "Section control"
8. "Protocol" -> "ASD"
9. "Implement type" -> Select the implement with which you are working.
10. "Tractor<-->Working point" -> Here, enter the distance between the suspension point of the tractor and the working point.



11. "Offset L/R" - This parameter is used to set the geometry of asymmetrical implements. Here, input the distance by which the middle of the working width should be shifted. For a shift to the right, enter a positive value, and for a shift to the left, enter a negative value.



12. "Working Width" - The working width set in the on-board computer.
13. "No. of sections" - The number of sections set in the on-board computer.

14. - Activate the ag equipment profile.
15. - Press and confirm in order to save the ag equipment profile.
16. Restart the terminal.

Further steps

You have set up the serial interface. You must now configure the applications of the terminal.

In the TRACK-Leader application:

1. Activate the "SECTION-Control" parameter under "Settings / General".
2. Configure the section switching in "Settings/ SECTION-Control".
3. Load a prescription map.

You can load the prescription map in two ways:

- As a shp file, in the TRACK-Leader application.
- As part of a ISO-XML task, if you are using the ISOBUS-TC application and a FMIS.

For more information, please refer to the TRACK-Leader and ISOBUS-TC operating instructions.

10 File Server application

The File Server application is used to define a save location on the terminal. This save location can be used by all ISOBUS implements which do not have their own USB interface. This enables the updating of certain ISOBUS job computers, and also the possibility of saving, for example protocols or error messages.

A "Fileserver" folder is created for this purpose on the hard disk of the terminal. All ISOBUS implements can access this folder, and write or read data there.

The folder has a maximum disk space of 5 MB.

Procedure

☑ If you want to copy files to the terminal, they must be on your USB memory device, in the "Fileserver" folder.

☑ The "File Server" plug-in is activated.

1. - Open the File Server application.
   ⇨ The application start screen will appear.
2. Tap "Storage".
3. - Copy files from the USB memory device onto the terminal (Import).
4. - Copy files from the SD card in the terminal to the USB memory device (Export).
   ⇨ One of the following messages will appear: "Start import?" or "Start export?".
5. To confirm, tap "Yes".
   ⇨ The data will be copied.
   ⇨ Here is an overview of the directories on the USB memory device: Directories on the USB memory device [➟ 28]
   ⇨ A report will appear.
6. To confirm, tap "OK".

⇨ You have successfully imported or exported the data.

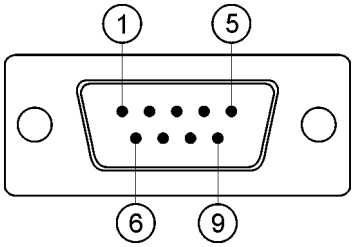
11 Technical specifications

11.1 Technical specifications of the terminal

Operating voltage	10V - 32V
Operating temperature	-30°C - +70°C
Storage temperature	-30°C - +85°C
Dimensions (W x H x D)	243mm x 186mm x 69mm
EMC	ISO14982
Protection class	IP54 according to ISO 20653:2013
ESD protection	ISO 10605:2001 Level IV
Power input	Typical: 15W
	Maximum: 60W
Display	8" SVGA TFT
Inputs / outputs	1 x USB 1 x D-sub 9 socket (CAN and power supply) 1 x D-sub 9 plug (RS232) 1 x D-sub 9 plug (RS232) 1 x M12 (camera) 1 x M12 (industrial Ethernet)

11.2 Assignment plans

11.2.1 Port A (CAN bus)

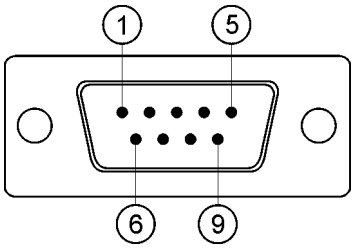


9-pole D-sub socket

Pin	Signal name	Function
1	CAN_L	CAN_L out
6	-Vin	Supply ground

Pin	Signal name	Function
2	CAN_L	CAN_L in
7	CAN_H	CAN_H in
3	CAN_GND	CAN ground, internally connected to the ground
8	CAN_EN_out	Switched input voltage, ≤ 200mA
4	CAN_H	CAN_H out
9	+Vin	Supply
5	Ignition	Ignition signal
Screen	Screen	ESD/EMC shielding

11.2.2 Port B



9-pin. D-Sub connector

Port B is a 9-pin D-Sub port.

The connector can be used for the following purposes depending on its assignment:

Purpose	Pins used
As second CAN interface	7, 9
As second serial interface	2, 3, 4, 5
As signal input for two digital and one analog signal.	1, 5, 6, 8

Pin	Signal name
1	Wheel sensor[1]
6	PTO[2]
2	/RxD2
7	CAN2_H
3	/TxD2
8	Working position sensor[3] or

Pin	Signal name
	Reverse signal for determining the course
4	Voltage supply for GPS receiver[4] Switched input voltage, ≤ 250mA
9	CAN2_L
5	GND
Screen	ESD/EMC shielding

Legend:

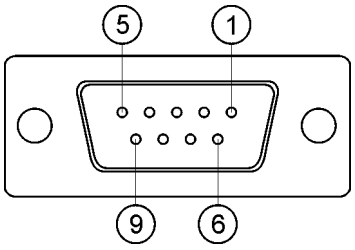
[1]) Digital input as per: ISO 11786:1995 chapter 5.2

[2]) Digital input as per: ISO 11786:1995 chapter 5.3

[3]) Analog input as per: ISO 11786:1995 chapter 5.5

[4]) The pin is switched in parallel with pin 4 by port C. Total loading is 600mA.

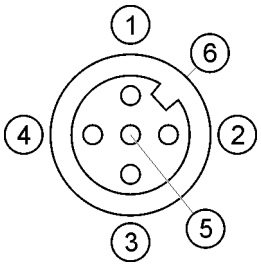
11.2.3 Port C (RS232)



9-pin D-sub socket

Pin	Signal name	Function
1	DCD	DCD
6	DSR	DSR
2	/RxD	/RxD
7	RTS	RTS
3	/TxD	/TxD
8	CTS	CTS
4	DTR	Switched input voltage, ≤ 200mA (alternatively DTR)
9	RI	5V (alternatively RI)
5	GND	Signal ground
Screen	Screen	ESD/EMC shielding

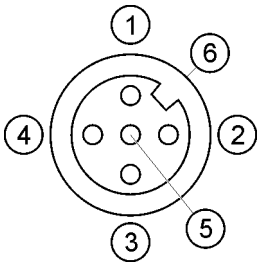
11.2.4 CAM port



M12 socket: Camera

Pin	Signal name	Function
1	Power	Voltage supply, max. 500mA total
2	Supply ground	Supply ground
3	FBAS2	Camera
4	FBAS	Camera
5	Signal ground	Signal ground
6	Screen	ESD/EMC shielding

11.2.5 ETH (Ethernet) port



M12 socket: Ethernet

Pin	Signal name	Function
1	TD+	white-orange
2	RD+	white-green
3	TD-	orange
4	RD-	green
5	Pin not present	Pin not present
Screen	Screen	ESD/EMC shielding

12 Notes